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MICROWARE

Apple Graphics Made Easy

Sharon Goodale Chumley

14-1441-A APPLE
APPLE GRAPHICS MADE EASY

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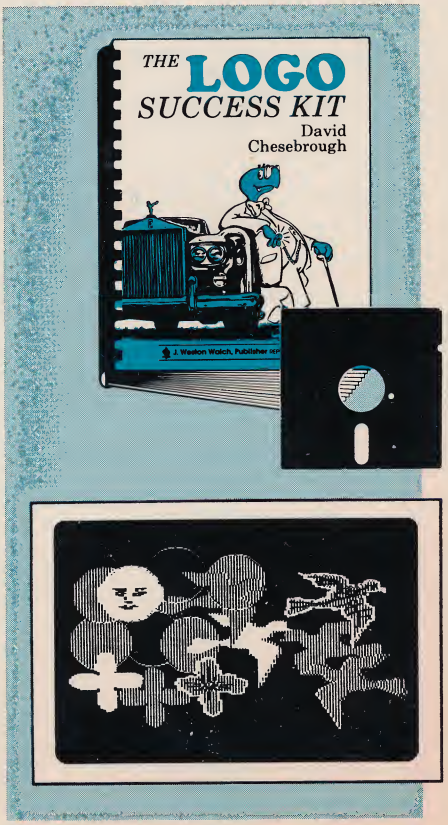

Shown above right is the bookcover of **The LOGO Success Kit**. At right is a screen display from **Apple Graphics Made Easy**.

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MICROWARE

MicroWare Handbook:

A Guide to J. Weston Walch Software

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Dear Educator:

Welcome to the world of J. Weston Walch, Publisher MicroWare! All of the software and courseware we publish has been created with you, the teacher, in mind. Most of the computer material we produce has been developed by teachers like you who recognize the potential of the computer in the classroom and want to make the most of it. The MicroWare in this package has undergone thorough development and refinement. The author(s) and our editorial staff have worked hard to bring you software that is educationally sound, motivating, and affordable. Much of our MicroWare has already been used in the classroom by the author(s) who developed it.

We're proud to put the Walch name on this software, and we're sure your students will learn from and enjoy it as well. If you have any comments or suggestions, please write us and let us know what you think.

J. Weston Walch, Publisher

Operating Instructions

Program Instructions

APPLE

Insert the disk in drive 1 and turn on the computer or type "IN#6" if the computer is already on to boot the disk. If you're using an Apple IIc, update the MicroWare disk to PRODOS before running the program.

COMMODORE 64

Insert the disk in the drive and type LOAD"JWW",8. When READY is displayed, type RUN.

PET

Insert the disk in the drive and type LOAD"$",8. When READY is displayed, type LIST to see the disk's directory. Type LOAD"filename",8, then RUN (*filename* is the name of the program you wish to run).

PC AND PCjr

Before running the program, put the disk operating system on the disk: Put the MicroWare disk in drive A and a system disk in drive B. Type: ADDSYS TWO. Follow the directions on the screen and the computer should do the rest. (If you have one disk drive, put the MicroWare disk in the drive, type ADDSYS ONE, then follow the directions on the screen.) To start the program, insert the MicroWare disk in drive A and turn on the computer or press Ctrl-Alt-Del simultaneously to reset and boot the disk.

TRS-80 III/4

Turn on the machine, insert the disk in drive 0 (the lower drive of a two-drive system); press the orange reset button at the right; enter the date in the format required; press ENTER twice. (The password for making backup copies using BACKUP is blank—just press return when asked for a password.)

Data Disk Instructions

DATA DISKS: A MicroWare data disk does not contain a program—it will not run if you try to boot it and/or your computer will display a message telling you the disk is not a "system" disk. Data disks are to be used with applications programs, such as word processing or spreadsheet programs, or high-level languages, such as Pascal. You must first boot the applications disk according to the instructions provided with it. Then you may access the files on the MicroWare data disk.

Working Copies

To make copies, follow the preceding directions for your model of computer and press T while holding down the control key when the J. Weston Walch copyright notice appears on the screen. (The control key for the TRS-80 III/4 and color computer is a combination of the shift key and the down arrow key.) PET disk: LOAD"COPY" and RUN. PET cassette: Follow the copying instructions in your system operations manual.

NOTE: CTRL-T will not work with a MicroWare data disk. Instructions for using the MicroWare data disk may be found in the accompanying teacher's guide.

Networking: A licensing agreement for the networking of Walch MicroWare is available upon request. The agreement contains two options:

(1) The right to use Walch software on a network contained within one room exclusively by the students of the teacher who purchased the software at a flat fee of twice the single copy price is granted.

(2) The right to use Walch software on a network contained within one room by the students of more than one teacher at a flat fee of three times the single copy price is granted.

Troubleshooting

If you're having trouble with a piece of software, try some of these solutions:

- Check the caps lock to see if it's up or down. The documentation should tell you whether you're to work in all uppercase letters, all lowercase letters, or a combination of the two.

- Be sure the program diskette is in the correct disk drive.

- Sometimes programs get "confused" when they are used a lot. Shut the system down and start over.

- Power surges or static electricity can cause problems. Shut the system down and start over.

- Pet and Commodore 64: If the loading message does not appear and a "file not found" error occurs, try the load command sequence several times. If this doesn't work, turn both the computer and the drive off, then back on to reset them.

If you're still having trouble with a J. Weston Walch MicroWare disk, you can call us on our MicroWare Hotline between 7:30 a.m. and 3:30 p.m. Eastern time. The toll-free number is 1-800-341-6094.

Disk Care and Maintenance

The software in this set should only be used to make sufficient working copies for your classes and then be placed in storage. We suggest that you use high-quality diskettes so they will stand up to sustained classroom use. Unless your computer is equipped with a double-sided drive, we also highly recommend single-sided diskettes, due to the wear and tear that a single-sided drive exacts upon a double-sided disk.

In order to protect your diskettes, the following cautions should be impressed upon your students:

- Don't bend, fold, or mutilate disks.
- Don't handle disks roughly.
- Don't touch the surface of disks.
- When disks are not being used, keep them in their protective sleeves.
- Keep magnets away from disks.
- Store disks vertically or horizontally—and never in stacks of more than ten.
- Don't squeeze disks.
- Don't leave disks lying around.
- Don't pile objects on top of disks.
- Don't use paper clips or rubber bands on disks.
- Print labels before applying to disks or use a felt pen once the labels are attached.
- Don't store disks where they will be subject to extreme temperatures.

Copyright

The computer is a powerful educational tool, but like all tools, it is totally worthless unless it's used; both the skill to manipulate the tool and an appropriate project upon which to use it are required if the implement is to be more than a decorative artifact. Students must have the knowledge to wield these powerful instruments and the software to energize them.

We at J. Weston Walch, Publisher feel that we share the responsibility with you, the teacher, to provide the instruction and the educational software that will permit your students to explore their potential. By providing high-quality computer material at a reasonable price in sufficient quantities for convenient classroom use, we hope to help you take advantage of the broad range of microcomputer applications.

To enable us to continue to develop such material, we depend on you, the teacher, to follow the guidelines for copying software and to encourage your students both by example and instruction to avoid illegal copying of software. Since many of our authors are teachers, we must provide them with sufficient incentive to find time in their busy schedules to devote to creating worthwhile computer material; if the royalties their programs accrue do not justify the considerable expenditure of effort top-notch programming requires, this valuable source of innovative material will disappear.

As partners in education, we must rely upon each other to satisfy our mutual obligations if our students are to continue to receive the quality of education they deserve.

Related Activities

The computer in the classroom works best when it is integrated with other classroom activities. Below are some suggested activities that can help bring your computer into the action.

POSTERS: Have your students create computer posters. A variety of themes are possible: how to take care of the computer and diskettes; the students' favorite programs and/or screens; the students' computer fantasies.

VOCABULARY: Have your students keep track of their favorite computer words. Or have them keep a list of unfamiliar words they find in the programs they use.

DISKETTES: Open up an old diskette and post it where all the students can touch and see it. Use it to explain why diskettes must be handled with care.

AWARDS: Make computer award certificates and present them to your students for outstanding computer work. Or have each one of your students create a certificate in a category of his or her choice (such as Best Keyboardist, Techiest Techie).

MICRO MONITORS: Enlist your students as computer monitors. Their jobs could be to keep the computer area neat or to see that everyone gets a turn at the micro. You could award the privilege to students who turn other homework in on time or get a high grade on homework or a test. Or you could rotate the privilege, allowing everyone to have a chance.

SOFTWARE STARS: Once your students have had a chance to sample a variety of programs, open nominations for the best computer program. Once nominations are in, prepare for an election. Have students campaign for their favorites and oversee the counting of secret ballots.

FAN MAIL: Have your students write letters to the authors of their favorite programs. Most software has the author's name(s) somewhere on the documentation or in the first screen of the program. Write to the authors in care of their publishers. Or have your students write one letter to the winner of the Software Stars election informing the winner of the honor.

Authors Wanted

J. Weston Walch, Publisher is always looking for new authors to join the ranks of the many teachers who have put their classroom experience to work in our publications. If you have developed computer software or courseware to use in your own classroom, we're interested in seeing it. Teachers know what works in the classroom, and we invite you to send us your materials for evaluation.

If you want us to consider your software for publication, please write and tell us the following:

- Describe your experience in programming, the languages you know, and the languages you can program in.
- Describe the program(s) you have developed, how you use them, and the students with whom you use them.
- List the objectives of your program(s) and how your program meets those objectives.
- List the computer(s) you work with and those you are capable of working with.
- Describe any supplementary activities you use with the program(s).
- Include any worksheets or exercises you use with the program(s).
- Include a demonstration disk of your program (if you have one), being sure to tell us on which computer it runs.

If you want us to consider computer print material for publication, write and tell us the following:

- Describe the potential publication(s).
- Describe the students you use the material with and how you use the material.
- Include sample pages.

Once you've sent us your material, please allow six to eight weeks for us to evaluate it. We will compare your proposal with material we already offer and our plans for future publications.

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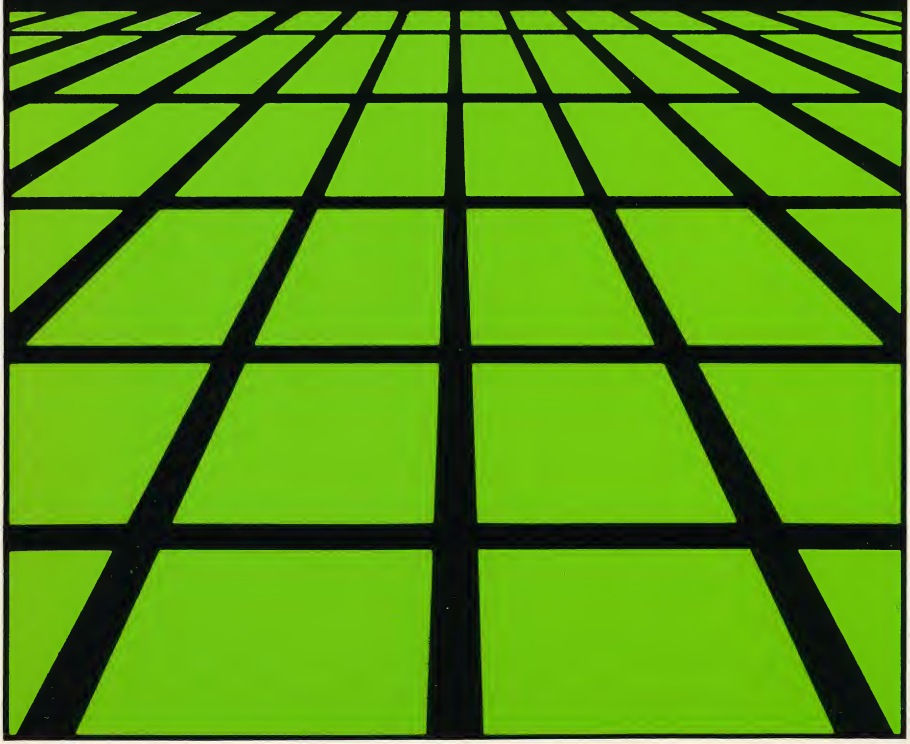
Sharon Goodale Chumley



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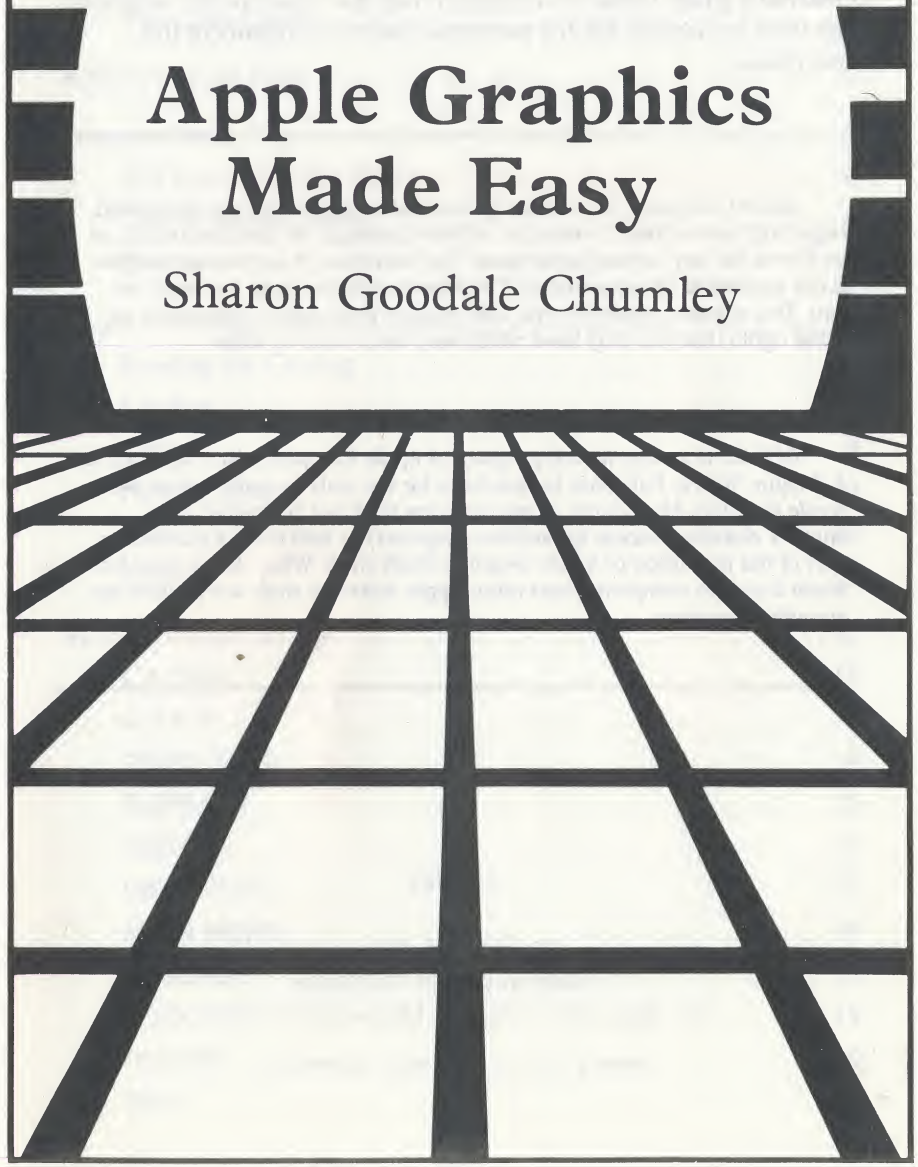

Apple Graphics Made Easy

Sharon Goodale Chumley

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WS23 .....

Introduction

The *Apple Graphics Made Easy* disk is designed to complement the worksheets and activities in the book. The disk contains two kinds of programs: graphics demonstration programs and answers to the 16 worksheets in the book. This booklet explains how to use the disk along with the activities in *Apple Graphics Made Easy*.

How to Make Copies

The *Apple Graphics Made Easy* disk was designed with curious students in mind. All programs on the disk have been documented with REM statements to help you and your students find your way around in the programs. You may make changes in the programs to demonstrate concepts or to solve programming problems. It is very important, however, that you work only with copies of the original *Apple Graphics Made Easy* disk.

You are granted permission to make as many copies of the disk as you require for use with your own students.

Before you do anything else with the disk, make at least two copies of the disk. Once you have two copies, store the original disk and one of the copies in a safe place. Use the other copy for making disks for your students to use. If you follow this procedure, you will always have two unchanged disks available for restoring any other copies you make to their original form. To make copies of the disk, follow the procedure below. You will need the DOS 3.3 System Master, the original *Apple Graphics Made Easy* disk, and blank disks.

One disk drive

1. Start the computer with the DOS 3.3 System Master disk. Be sure the **CAPS LOCK** key is down. When the disk drive stops spinning, type **RUN COPYA**, then press **RETURN**. When the disk drive stops spinning, take the DOS 3.3 disk out of the drive.

2. Press **6** for the slot number, then press **1** for the *original* drive number. Next, press **6** for the slot number, then press **1** for the *duplicate* drive number.
3. Put the original *Apple Graphics Made Easy* disk in the drive. Have the blank disk labeled and ready to go. Press **RETURN** when you're ready to start copying.
4. The program will tell you when to put the blank disk (the one that will become the duplicate) in the drive. Press **RETURN** whenever you're ready for the program to continue. When the program has finished making the copy it will ask if you want to make another. To make another copy, have another blank disk ready, then press **Y** and **RETURN**. Follow the instructions on the screen as you did with the first copy.

Two disk drives

1. Start the computer with the DOS 3.3 System Master disk. Be sure the **CAPS LOCK** key is down. When the disk drive stops spinning, type **RUN COPYA**, then press **RETURN**. When the disk drive stops spinning, take the DOS 3.3 disk out of the drive.
2. Press **6** for the slot number, then press **1** for the *original* drive number. Next, press **6** for the slot number, then press **2** for the *duplicate* drive number.
3. Put the original *Apple Graphics Made Easy* disk in drive 1. Put a labeled, blank disk (the one that will become the duplicate) in drive 2.
4. Press **RETURN** when you are ready to begin copying. When the program has finished making the copy it will ask if you want to make another. To make another copy, take the duplicate disk out of drive 2, put another blank disk in drive 2, then press **RETURN** twice to begin copying again.

How to Use the Disk

After you have made two copies of the disk, it's a good idea to preview it to see how it will fit into your classroom. The graphics demonstration is a good introduction to Apple graphics. Your students will be impressed with what they are going to learn and motivated to start learning.

As you work through the book, some of the demonstration programs are mentioned in the notes to the teacher and students in Chapters 1, 4, 5, 6, and 8. You may want to set aside class time for your students to view and discuss the specific programs mentioned.

The disk also contains answers to some of the worksheets in Chapters 3, 5, 6, and 8. Students may compare their programs to those on the *Apple Graphics Made Easy* disk. Students who have trouble visualizing the results of a program may refer to the disk for help.

All programs on the disk can be listed, either on the screen or with a printer. More advanced students may be challenged by trying to improve the programs on the disk. You might also challenge your advanced students to prepare their own demonstration disks, complete with opening graphics and menus.

Program Notes

Here's an easy method for starting *Apple Graphics Made Easy* while being kind to your disk drives:

1. Turn on your computer. Press **CTRL-RESET**, letting up on **RESET** first. This will make the drive stop spinning.
2. Put a copy of the *Apple Graphics Made Easy* disk in the drive.
3. Press **CTRL-OPEN APPLE-RESET**, letting up on **RESET** first. This will "boot" the disk and start the program.

The title screen is displayed first. Press any key to display the Main Menu, which looks like the menu on the next page.

```
MAIN MENU

PRESS G TO START GRAPHICS
      DEMONSTRATION

PRESS D FOR DEMONSTRATION MENU

PRESS W FOR WORKSHEET MENU

PRESS E TO END THIS PROGRAM

BE SURE CAPS LOCK KEY IS DOWN
```

If you press a key at the Main Menu and nothing happens, check the **CAPS LOCK** key to be sure it is down. Once the **CAPS LOCK** key is down, the program should recognize the keys you press.

The first time you run the program, as a preview or with your students, press **G** to start the graphics demonstration. This demonstration has its own title screen, which includes music. After the title screen, the program displays a picture of a Siamese cat and an introductory message. After the introductory message, the program returns to the Main Menu.

The Demonstration Menu

Press **D** to display the Demonstration Menu, shown on the next page. The Demonstration Menu enables you to run eight graphics demon-stration programs. These are the programs referred to in the teacher's and students' notes in the book.


```
DEMONSTRATION MENU

PRESS C FOR COLOR DEMONSTRATION
PRESS S FOR SIAMESE CAT
PRESS L FOR TUNNELS
PRESS P FOR PLAY POOL
PRESS D FOR DIGITAL CLOCK
PRESS B FOR BABY ELEPHANT
PRESS R FOR RANDOM SQUARES
PRESS T FOR SEASONAL TREE
PRESS I FOR THE INDIVIDUAL
PRESS M FOR MAIN MENU
PRESS W FOR WORKSHEET MENU
PRESS E TO END THIS PROGRAM
```

Press the letter given for the demonstration program you wish to see. The program returns to the Demonstration Menu after each demonstration program. Here are a few notes that you may find useful for each of the demonstration programs.

Color Demonstration: This program will help you adjust the color on your monitor. It may also be used to help your students associate the color numbers used in Applesoft BASIC with the colors themselves. The Color Demonstration is referred to in the notes in Chapter 1 of the book.

Siamese Cat: This cat, named Caesar, is the same as the cat that follows the graphics demonstration title screen. The Siamese Cat demonstration is referred to in the notes in Chapters 4 and 6 of the book.

Tunnels: Motion is demonstrated in this program. The program will continue to make tunnels for as long as you press **C** when prompted. Press any other key to return to the Demonstration Menu. The Tunnels demonstration is referred to on Worksheet 12 and in the notes in Chapter 5 of the book.

Play Pool: This program contains a little sound—the sound of the balls hitting each other. The Play Pool demonstration is referred to on Worksheet 13 and in the notes in Chapter 5 of the book.

Digital Clock: The clock begins with the date, 9-26-85, then displays the time, starting at 1Ø:37:57. The program ends when the time is 1Ø:38:12. The Digital Clock demonstration is referred to on Worksheet 11 (Chapter 5) of the book.

Baby Elephant: Sound and motion are demonstrated in this program. If your students are skeptical about learning computer graphics, this clever program will help generate some enthusiasm. The Baby Elephant demonstration is referred to on Worksheets 14 and 15 and in the notes in Chapters 5 and 6 of the book.

Random Squares: This program also contains sound and is quite eye-catching. The Random Squares demonstration is referred to in the notes in Chapter 6 of the book.

Seasonal Tree: Set the ground color by pressing **G**, then choose the season by pressing **L**. When you're done with the tree, press **E** to return to the Demonstration Menu. The Seasonal Tree demonstration is referred to in the notes in Chapter 6 of the book.

The Individual: This program uses high-resolution graphics. The Individual demonstration is referred to in the notes in Chapter 8 of the book.

The Worksheet Menu

Press **W** at the Main Menu or the Demonstration Menu to display the Worksheet Menu. The Worksheet Menu enables you to see the answers to 16 of the worksheets in the book. The Worksheet Menu is on the next page.

WORKSHEET MENU

PRESS 3 FOR CH. 3 WORKSHEETS
PRESS 5 FOR CH. 5 WORKSHEETS
PRESS 6 FOR CH. 6 WORKSHEETS
PRESS 8 FOR CH. 8 WORKSHEETS
PRESS M FOR MAIN MENU
PRESS D FOR DEMONSTRATION MENU

PRESS E TO END THIS PROGRAM

Press **3** to display the Chapter 3 Worksheet Menu. The Chapter 3 Worksheet Menu enables you to see the answers to Worksheets 5, 6, 7, 8, and 9. Press the number of the worksheet for which you would like to see answers. Press **W** to return to the Worksheet Menu.

Press **5** to display the Chapter 5 Worksheet Menu. The Chapter 5 Worksheet Menu enables you to see the answers to Worksheets 11, 12, 13, 14, and 15. Press the second digit of the number of the worksheet for which you would like to see answers. (For example, press **3** to see the answers to Worksheet 13.) Press **W** to return to the Worksheet Menu.

Press **6** to display the Chapter 6 Worksheet Menu. The Chapter 6 Worksheet Menu enables you to see the answers to Worksheets 16, 17, and 18. Press the second digit of the number of the worksheet for which you would like to see answers. (For example, press **7** to see the answers to Worksheet 17.) Press **W** to return to the Worksheet Menu.

The End

To run a graphics demonstration called "The End," press **E** when you see the message PRESS E TO END THIS PROGRAM. You can run "The End" from the Main Menu, the Demonstration Menu, the Worksheet Menu, and each of the chapter menus.

Program Listings

The last section of this booklet contains a listing of all the REM statements in the programs on the disk. REM statements are remarks that are not executed by the computer. REM statements are used to mark sections of a program and to help explain what the program is doing in a specific section. All of the Applesoft BASIC programs on the *Apple Graphics Made Easy* disk have been documented with REM statements. There are three files on the disk that are not BASIC files: **LOGO1**, **LOGO2**, and **PICTR. THE INDIVIDUAL**. These files are binary files and are used to display high-resolution graphics. The other 19 files on the disk are Applesoft BASIC files that you and your students may load, list, and run.

Reading the Catalog

To see a list of files on the *Apple Graphics Made Easy* disk, start the computer with the DOS 3.3 System Master. When the drive stops spinning, take the System Master out of the drive and insert a copy of the *Apple Graphics Made Easy* disk. Type **CATALOG**. The computer will read the catalog of the disk and display as much as will fit on the screen. To see the rest of the catalog, press the **SPACE BAR**. Here is the catalog for the *Apple Graphics Made Easy* disk.

```
A Ø24 HELLO
A Ø14 CAESAR
A ØØ5 MESSAGE
A ØØ6 MAIN MENU
A ØØ7 THE END
A Ø72 WORKSHEET MENU
A ØØ6 WS18 FLOWER1
A ØØ7 WS18 FLOWER2
A Ø1Ø WS21
```



```
A ØØ9 WS22
A ØØ WS23
A Ø23 DEMO MENU
A ØØ6 TUNNELS
A Ø24 POOL
A Ø11 CLOCK
A Ø53 ELEPHANT
A Ø22 TREE
A Ø14 INDIVIDUAL
B Ø34 PICTR. THE INDIVIDUAL
B Ø33 LOGO2
B Ø33 LOGO1
A ØØ5 JWW
```

The third column of the catalog contains the names of all the files on the disk. The middle column tells you the size of each file in sectors. The first column tells you the type of each file. An A in the first column means that the file is an Applesoft BASIC file. A B in the first column means that the file is a binary file.

Loading

To look at a program, you first need to load it. To load an Applesoft BASIC program, type **LOAD filename** and press **RETURN.** Instead of typing **filename**, type the name of the file you want to look at. For example, to load **WORKSHEET MENU**, type **LOAD WORKSHEET MENU** and press **RETURN.** When you press **RETURN** the drive will spin while the computer loads the program and the cursor will disappear from the screen. When the cursor reappears on the screen, the program has been loaded into the computer's memory and is ready for you to look at.

Listing

Now that the program is loaded, you may look at it by typing **LIST** and pressing **RETURN**. You'll find that the program will scroll (move

from top to bottom) faster than you can read it. To stop the scrolling press **CTRL-S**. To start the scrolling again, press any other key. To stop listing the program press **CTRL-C**. This will "break" the program and stop the listing so that you may do other things.

To print a listing of the program, be sure the printer is hooked up and ready to print. Type **PR#1** and press **RETURN** . Now everything that is displayed on the screen will also be sent to the printer. If your printer is hooked up correctly (it must be in slot 1 for the PR#1 command to work), you will get a printed listing of the program as it is displayed on the screen. To return the computer to screen-only display press **CTRL-RESET** or type **PR#0** and press **RETURN**.

Partial Listings

Many times you will want to list only a portion of a program. To list one line type **LIST** followed by the line number. For example, to list line 100, type **LIST 100** and press **RETURN**. To list more than one line, type **LIST** followed by the first line number you want listed, a dash, then the last line number. For example, to list lines 100 through 165, type **LIST 1ØØ-165** and press **RETURN.**

If you have used the PR#1 command, the partial listing will be sent to the printer as well as being displayed on the screen.

Making Changes

To change a line, type the line number and then the line. For example, if line 25 says PRINT "PRES E TO END THIS PROGRAM" and you want to correct the misspelling of PRESS, you type **25 PRINT "PRESS E TO END THIS PROGRAM"** and press **RETURN**. When you press **RETURN** the change is recorded in memory. To record the changes on the disk type **SAVE filename.** Type the name of the file instead of **filename**. For example, if you want to record changes you have made in file **MENU,** type **SAVE MENU** and press **RETURN**.

To delete a line completely, type the line number and then press **RETURN**. For example, if you want to delete line 45 from a program, just type **45** and press **RETURN**. To delete more than one line, type **DEL**

followed by the number of the first line you want to delete, a comma, then the last line. For example, if you want to delete lines 100 through 275, type **DEL 1ØØ,275** and press **RETURN**. When you press **RETURN** the lines are erased from memory. To record the deletions on the disk, save the program as explained in the paragraph above.

Running

After you have loaded, listed, and changed a program, you will want to see if it works. Type **RUN** and press **RETURN.** The computer will execute the program in memory. To run a program that is not in memory (you haven't loaded it), type **RUN filename.** For example, to run **MENU** when it is not in memory, type **RUN MENU** and press **RETURN.**

To stop a program that you have run, press **CTRL-C.** This will "break" the program and display the line number that was being executed at the time you pressed **CTRL-C**. Once you have broken out of the program, you may list it and make changes in it. If the program has an error in it, it will stop executing and display an error message. It's a good idea to have some reference manuals around for your students to use while they're trying to debug (remove the errors in) a program.

REM Statement Listings

The following REM statement listings contain all of the REM statements for 18 of the programs on the *Apple Graphics Made Easy* disk. The only Applesoft BASIC file that is not included in this listing is **JWW.** This file is used to start the program and loads the opening J. Weston Walch MicroWare title screens.

Line 1 in every file contains the file name of the program. Line 2 in every file contains a short description of what the program does. The remaining REM statement lines serve as markers.

The file you will probably refer to most often is **WORKSHEET MENU.** This file contains the answers to worksheets in Chapters 3, 5, and 6. The answers to Worksheets 18 (Chapter 6), 21, 22, and 23 (Chapter 8) are in separate files. REM statements in **WORKSHEET MENU** will tell you which files are loaded for the answers to worksheets 18 and 21-23.

The REM statement listings are organized alphabetically by file name.

File Name: **CAESAR**

```
   1 REM  * FILE NAME IS CAESAR *
   2 REM  * CAESAR/SIAMESE CAT DEMO *
  2Ø REM  * WALL BACKGROUND Ø-3ØØ *
 4ØØ REM  * FLOOR AND RUG 4ØØ-6ØØ *
 7ØØ REM  * SIAMESE CAT *
 72Ø REM  * EARS AND MOUTH *
 82Ø REM  * BLACK STRIPE *
 92Ø REM  * TAIL *
1Ø2Ø REM  * BROWN BODY *
112Ø REM  * WHITE *
122Ø REM  * GRAY STRIPES *
13ØØ REM  * WIGGLE TAIL *
14ØØ REM  * NEW TAIL POSITION *
144Ø REM  * REPLACE BACKGROUND *
153Ø REM  * RETURN TO ORIGINAL TAIL POSITION *
157Ø REM  * REPLACE ORIGINAL BACKGROUND *
```

File Name: **CLOCK**

```
   1 REM  * FILE NAME IS CLOCK *
   2 REM  * DIGITAL CLOCK DEMO *
  2Ø REM  * LOOP FOR CLOCK FRAME *
  7Ø REM  * LOOP FOR CLOCK FACE *
24ØØ REM  * DISPLAY THE DATE *
25ØØ REM  * PAUSE '1 SECOND' *
27ØØ REM  * Ø *
271Ø REM  * 1 *
272Ø REM  * 2 *
273Ø REM  * 3 *
274Ø REM  * 4 *
275Ø REM  * 5 *
```

File Name: **CLOCK** *(continued)*

```
276Ø  REM   * 6 *
277Ø  REM   * 7 *
278Ø  REM   * 8 *
279Ø  REM   * 9 *
```

File Name: **DEMO MENU**

```
   1  REM   * FILE NAME IS DEMO MENU *
   2  REM   * DEMONSTRATION MENU PROGRAM *
 7ØØ  REM   * DEMONSTRATION MENU *
13ØØ  REM   * COLOR DEMO *
155Ø  REM   * SPACE FOR NEXT DEMO *
3549  REM   * RANDOM SQUARES DEMO *
3684  REM   * MAKE SQUARE *
373Ø  GOTO  8ØØ: REM * RETURN TO DEMO MENU *
374Ø  REM   * SIAMESE CAT IS IDENTICAL TO FILE CAESAR *
3752  REM   * WALL BACKGROUND 375Ø-38ØØ *
38ØØ  REM   * FLOOR AND RUG 38ØØ-3834 *
3836  REM   * SIAMESE CAT *
384Ø  REM   * EARS AND MOUTH *
3844  REM   * BLACK STRIPE *
385Ø  REM   * TAIL *
386Ø  REM   * BROWN BODY *
387Ø  REM   * WHITE BODY *
3884  REM   * GRAY STRIPES *
389Ø  REM   * WIGGLE TAIL *
39Ø4  REM   * NEW TAIL POSITION *
3912  REM   * REPLACE BACKGROUND *
393Ø  REM   * RETURN TO ORIGINAL TAIL POSITION *
3938  REM   * REPLACE ORIGINAL BACKGROUND *
```


File Name: **ELEPHANT**

```
   1  REM   * FILE NAME IS ELEPHANT *
   2  REM   * BABY ELEPHANT DEMO *
1835  REM   * DO THE GRAPHIC *
184Ø  REM   * ONE HLIN AT A TIME *
1845  REM   * X, Y IS THE START POSITION *
185Ø  REM   * C IS COLOR, L IS LENGTH *
3Ø5Ø  REM   * ELE IS INIT *
3Ø6Ø  REM   * TRUNK MOVEMENT *
3Ø65  REM   * F IS 'FLAG' FOR 'HOW FAST' TO MOVE TRUNK
3Ø7Ø  REM   * D IS POSITION #. B IS BACKFILL *
3Ø75  REM   * THERE ARE FOUR SUBROUTINES *
3Ø8Ø  REM   * SUB #1 *
3Ø85  REM   * FROM INIT TO DOWN *
3739  REM   * SUB #2 *
374Ø  REM   * FROM DOWN TO INIT *
3849  REM   * SUB #3 *
385Ø  REM   * FROM INIT TO UP *
4179  REM   * SUB #4 *
418Ø  REM   * FROM UP TO INIT *
428Ø  REM   * THIS PROGRAM PLAYS ORIGINAL MUSIC
              COMPOSED BY ZANE CHUMLEY *
4285  REM   * THE BEATS ARE INSERTED IN DATA BY NAM-
              ING THE TYPE OF NOTE, I.E., QUARTER NOTE
              (4), HALF NOTE (2), DOTTED HALF (2.5).
              MORE THAN THREE COUNTS CANNOT BE
              DONE AT THIS METRONOME SETTING *
447Ø  REM     PROGRAM THE TRUNK *
```

File Name: **HELLO**

```
    1 REM  * FILE NAME IS HELLO *
    2 REM  * TITLE PAGE PROGRAM *
  10Ø REM  * A *
  11Ø REM  * C IS Ø - 15 FOR THE COLOR
  12Ø REM  * X, Y ARE Ø - 39 FOR THE UPPER LEFT OF THE
             LETTER *
  13Ø REM  * LETTERS ARE 7 PIXELS TALL *
  14Ø REM  * LETTERS ARE 3 PIXELS WIDE *
  20Ø REM  * B *
  3ØØ REM  * C *
  4ØØ REM  * D *
  5ØØ REM  * E *
  51Ø REM  * C IS Ø - 15 FOR THE COLOR *
  52Ø REM  * X,Y ARE Ø - 39 FOR THE UPPER LEFT OF THE
             LETTER *
  53Ø REM  * LETTERS ARE 7 PIXELS TALL *
  54Ø REM  * LETTERS ARE 3 PIXELS WIDE *
  7ØØ REM  * G *
  8ØØ REM  * H *
  81Ø REM  * C IS Ø - 15 FOR THE COLOR *
  82Ø REM  * X, Y ARE Ø - 39 FOR THE UPPER LEFT OF THE
             LETTER *
  83Ø REM  * LETTERS ARE 7 PIXELS TALL *
  84Ø REM  * LETTERS ARE 3 PIXELS WIDE *
  9ØØ REM  * I *
  91Ø REM  * C IS Ø - 15 FOR THE COLOR *
  92Ø REM  * X, Y ARE Ø - 39 FOR THE UPPER LEFT OF THE
             LETTER *
```


File Name: **HELLO** *(continued)*

```
  93Ø REM  * LETTERS ARE 7 PIXELS TALL *
  94Ø REM  * LETTERS ARE 3 PIXELS WIDE *
 1ØØØ REM  * L *
 12ØØ REM  * M *
 14ØØ REM  * N *
 15ØØ REM  * O *
 16ØØ REM  * P *
 18ØØ REM  * R *
 19ØØ REM  * S *
 2000 REM  * T *
 2Ø1Ø REM  * C IS Ø - 15 FOR THE COLOR *
 2Ø2Ø REM  * X, Y ARE Ø - 39 FOR THE UPPER LEFT OF THE
             LETTER *
 2Ø3Ø REM  * LETTERS ARE 7 PIXELS TALL *
 2Ø4Ø REM  * LETTERS ARE 3 PIXELS WIDE *
 21ØØ REM  * U *
 22ØØ REM  * Y *
 29ØØ REM  * MAIN PART OF PROGRAM *
 4299 REM  * ADD THE AUTHOR'S NAME *
 44ØØ REM  * PUT CAESAR HERE *
 1ØØØØ REM  * MUSICAL DATA BANKS *
 1ØØØ1 REM  * BY ZANE CHUMLEY
```

File Name: **INDIVIDUAL**

```
    1 REM  * FILE NAME IS INDIVIDUAL *
    2 REM  * HI-RES GRAPHICS DEMO *
  5ØØ REM  **********************
  51Ø REM  ***     INDIVIDUAL     ***
```

File Name: **INDIVIDUAL** *(continued)*

```
52Ø  REM  ***   PROGRAM DESIGN   ***
53Ø  REM  ******************************
54Ø  REM  *          INITIALIZE        *
55Ø  REM  *      DISPLAY THE POEM      *
56Ø  REM  *     CONTOUR THE BIRDS      *
57Ø  REM  *     PLOT THE FLOWERS       *
58Ø  REM  *          EXIT              *
59Ø  REM  ******************************
595  REM
6ØØ  REM  * INITIALIZE *
61Ø  REM  * GENERAL PROGRAM *
63Ø  REM
64Ø  REM  * POEM *
65Ø  REM  * INITIALIZE ELLIPSES *
66Ø  REM  * NE IS NUMBER OF ELLIPSES *
67Ø  REM  * EX IS X-COORDINATE OF CENTERS *
68Ø  REM  * EY IS Y-COORDINATE OF CENTERS *
69Ø  REM  * EQUATION IS 24*24*X*X+21*21*Y*Y
          =24*24*+21*21 *
76Ø  REM  * INITIALIZE BIRDS *
77Ø  REM  * NB = NUMBER OF BIRDS *
78Ø  REM  * BX = X-COORDINATE OF BEAK POINT *
79Ø  REM  * BY = Y-COORDINATE OF BEAK POINT *
8ØØ  REM  * BD = BIRD FLYING DIRECTION, Ø = RIGHT, 1
          = LEFT *
81Ø  REM  * XBIRD = X DELTA, POINT TO POINT *
82Ø  REM  * YBIRD = Y DELTA, POINT TO POINT *
83Ø  REM  * NP = NUMBER OF POINTS *
96Ø  REM  * INITIALIZE FLOWERS *
97Ø  REM  * NF = NUMBER OF FLOWERS *
98Ø  REM  * FX = X-COORDINATE CENTER OF FLOWER *
99Ø  REM  * FY = Y-COORDINATE CENTER OF FLOWER *
```


File Name: **INDIVIDUAL** *(continued)*

```
1Ø6Ø  REM  * DISPLAY THE POEM *
12ØØ  REM  * DRAW THE ELLIPSES *
131Ø  REM  * DRAW THE BIRDS *
148Ø  REM  * DRAW THE FLOWERS *
```

File Name: **MAIN MENU**

```
   1  REM  * FILE NAME IS MAIN MENU *
   2  REM  * MAIN MENU PROGRAM *
5ØØ  REM  * MAIN MENU *
```

File Name: **MESSAGE**

```
   1  REM  * FILE NAME IS MESSAGE *
   2  REM  * GRAPHICS PROGRAM INTRODUCTION *
```

File Name: **POOL**

```
   1  REM  * FILE NAME IS POOL *
   2  REM  * PLAY POOL DEMO *
1ØØ  REM  * INITIALIZE VARIABLES *
259  REM  * PLACE BALLS ON TABLE *
835  REM  * S(X)= 1 MEANS BALL IS MOVING *
862  REM  * M > Ø MEANS SOME BALL IS MOVING *
865  REM  * T IS FOR TIME *
875  REM  * L IS FOR LOSS DUE TO IMPACT *
885  REM  * F IS FOR LOSS DUE TO FRICTION *
9ØØ  REM  * IMPACT *
```

File Name: **POOL** *(continued)*

```
 9Ø1  REM  * SET UP TABLE *
2ØØØ  REM  * CUE BALL MOVEMENT *
21ØØ  REM  * ONE BALL MOVEMENT *
22ØØ  REM  * TWO BALL MOVEMENT *
23ØØ  REM  * THREE BALL MOVEMENT *
24ØØ  REM  * FOUR BALL MOVEMENT *
25ØØ  REM  * FIVE BALL MOVEMENT *
26ØØ  REM  * SIX BALL MOVEMENT *
27ØØ  REM  * SEVEN BALL MOVEMENT *
28ØØ  REM  * EIGHT BALL MOVEMENT *
29ØØ  REM  * NINE BALL MOVEMENT *
3ØØØ  REM  * TEN BALL MOVEMENT *
31ØØ  REM  * ELEVEN BALL MOVEMENT *
32ØØ  REM  * TWELVE BALL MOVEMENT *
33ØØ  REM  * THIRTEEN BALL MOVEMENT *
34ØØ  REM  * FOURTEEN BALL MOVEMENT *
35ØØ  REM  * FIFTEEN BALL MOVEMENT *
4ØØØ  REM  * MOVE THE BALL SELECTED BY J *
42ØØ  REM  * DETERMINE IF BALL IN COLLISION *
4275  REM  * FIGURE OUT NEW DIRECTIONS *
43ØØ  REM  * DETERMINE IF BALL HITS WALL *
44ØØ  REM  * DETERMINE IF BALL IN HOLE *
449Ø  REM  * CLEAN UP *
45ØØ  REM  * PLOT NEW POSITION *
46ØØ  REM  * UPDATE TABLE *
```

File Name: **THE END**

```
1  REM  * FILE NAME IS THE END *
2  REM  * GRAPHICS PROGRAM ENDING *
```


File Name: **THE END** *(continued)*

```
66Ø  REM  * T *
67Ø  REM  * C IS Ø - 15 FOR THE COLOR *
68Ø  REM  * X,Y ARE Ø - 39 FOR THE UPPER LEFT OF THE
          LETTER *
69Ø  REM  * LETTERS ARE 7 PIXELS TALL *
7ØØ  REM  * LETTERS ARE 3 PIXELS WIDE *
75Ø  REM  * E *
82Ø  REM  * D *
91Ø  REM  * H *
97Ø  REM  * N *
```

File Name: **TREE**

```
  1  REM  * FILE NAME IS TREE *
  2  REM  * SEASONAL TREE DEMO *
 2Ø  REM  * DO GRAY SKY *
 35  REM  * DO GREEN GROUND *
 6Ø  REM  * DO TREE *
135  REM  * INITIALIZE LEAVES *
 18Ø  REM  * GET USER SELECTION *
245  REM  * GET USER GROUND COLOR *
 29Ø  REM  * GET USER LEAF SELECTION *
335  REM  * DO SKY *
365  REM  * DO GROUND *
425  REM  * DO SPRING/SUMMER *
 51Ø  REM  * DO FALL/WINTER *
```

File Name: **TUNNELS**

```
   1  REM   * FILE NAME IS TUNNELS *
   2  REM   * RAINBOW TUNNELS DEMO *
 1ØØ  REM   * SOUTHEAST *
 2ØØ  REM   * NORTHEAST *
 3ØØ  REM   * NORTHWEST *
 4ØØ  REM   * SOUTHWEST *
 5ØØ  REM   * MAKE THE SQUARE *
 6ØØ  REM   * CHOOSE COLOR *
 749  REM   * RETURN TO DEMO MENU *
```

File Name: **WORKSHEET MENU**

```
   1  REM   * FILE NAME IS WORKSHEET MENU *
   2  REM   * CONTAINS WORKSHEET ANSWERS AND
             SAMPLE PROGRAMS *
 5ØØ  REM   * WORKSHEET MENU *
1619  REM   * CHAPTER 3 WORKSHEETS *
1998  REM   * CHAPTER 3 - WORKSHEET 5 PROBLEMS *
1999  REM   * WORKSHEET 5 - PROBLEM 1 *
2Ø39  REM   * WORKSHEET 5 - PROBLEM 2 *
2Ø89  REM   * WORKSHEET 5 - PROBLEM 3 *
2129  REM   * WORKSHEET 5 - PROBLEM 4 *
2238  REM   * CHAPTER 3 - WORKSHEET 6 PROBLEMS *
2239  REM   * WORKSHEET 6 - PROBLEM 1A *
2319  REM   * WORKSHEET 6 - PROBLEM 1B *
2429  REM   * WORKSHEET 6 - PROBLEM 1C *
2589  REM   * WORKSHEET 6 - PROBLEM 1D *
```


File Name: **WORKSHEET MENU** *(continued)*

```
2779  REM   * WORKSHEET 6 - PROBLEM 2 *
2898  REM   * CHAPTER 3 - WORKSHEET 7 PROBLEMS *
2899  REM   * WORKSHEET 7 - PROBLEM 1 *
2959  REM   * WORKSHEET 7 - PROBLEM 2 *
3248  REM   * CHAPTER 3 - WORKSHEET 8 PROBLEMS *
3249  REM   * WORKSHEET 8 - PROBLEM 1 *
3329  REM   * WORKSHEET 8 - PROBLEM 2 *
34Ø9  REM   * WORKSHEET 8 - PROBLEM 3 *
3489  REM   * WORKSHEET 8 - PROBLEM 4 *
3629  REM   * WORKSHEET 8 - PROBLEM 5 *
3898  REM   * CHAPTER 3 - WORKSHEET 9 PROBLEMS *
3899  REM   * WORKSHEET 9 - PROBLEM 1 *
4Ø69  REM   * WORKSHEET 9 - PROBLEM 2 *
4139  REM   * WORKSHEET 9 - PROBLEM 3 *
4229  REM   * WORKSHEET 9 - PROBLEM 4 *
4441  x=3:  REM     * CHAPTER 5 WORKSHEETS *
4551  REM   * WORKSHEET 11 *
4556  REM   * TWO LOOPS FOR CLOCK FRAME *
4574  REM   * LOOP FOR CLOCK FACE *
46Ø4  REM   * FILL IN CLOCK FACE *
4699  REM   * WORKSHEET 12 *
4899  REM   * WORKSHEET 13 - PROBLEM 1 *
49Ø8  REM   * LOOP FOR CLOCK FRAME *
4926  REM   * LOOP FOR CLOCK FACE *
4954  REM   * FILL IN CLOCK FACE *
5Ø19  REM   * WORKSHEET 13 - PROBLEM 2 *
5Ø39  REM   * WORKSHEET 13 - PROBLEM 3 *
5Ø59  REM   * WORKSHEET 13 - PROBLEM 4 *
5Ø99  REM   * WORKSHEET 14 *
5299  REM   * WORKSHEET 15 *
5348  REM   * DRAW BACKGROUND *
5372  REM   * DRAW DUCK *
```

File Name: **WORKSHEET MENU** *(continued)*

```
5404  REM    * OLD MACDONALD *
5500  REM    * CHAPTER 6 WORKSHEETS *
5533  REM    * WORKSHEET 16 - PROBLEM 1 *
5564  GR :   HOME  : REM *WORKSHEET 16 - PROBLEM 3 *
5579  GR :   HOME  : REM *WORKSHEET 16 - PROBLEM 4 *
5594  GR :   HOME  : REM *WORKSHEET 16 - PROBLEM 5 *
5609  GR :   HOME  : REM *WORKSHEET 16 - PROBLEM 6 *
5625  REM    HOME  : REM *WORKSHEET 16 - PROBLEM 7 *
5627  RESTORE : REM * SUBROUTINE TO SING *
5649  REM    * DRAW BACKGROUND *
5679  REM    * OLD MACDONALD *
5697  REM    * WORKSHEET 17 - PROBLEM 1 *
5712  REM    * BACKGROUND *
5721  REM    * ENGINE *
5747  GR :   HOME : REM * WORKSHEET 17 - PROBLEM 2 *
5768  REM    * BACKGROUND *
5778  REM    * ENGINE *
5806  REM    * WORKSHEET 10 - FILE NAME IS WS18
               FLOWER1 *
5900  REM    * WORKSHEET MENU *
59125  GET     B$: REM * WORKSHEETS 21-33 ARE IN FILES
               WS21, WS22, WS23 *
```

File Name: **WS18 FLOWER 1**

```
 1  REM   * FILE NAME IS WS18 FLOWER1 *
 2  REM   * WORKSHEET 18 - PROBLEM 1 *
 20  REM   * INITIALIZE *
 300  REM   * DRAW FLOWER *
 505  REM   * GO TO WORKSHEET 18 - PROBLEM 5 *
```


File Name: **WS18 FLOWER 2**

```
 1  REM   * FILE NAME IS WS18 FLOWER2 *
 2  REM   * WORKSHEET 18 - PROBLEM 5 *
 20  REM   * INITIALIZE *
 300  REM   * DRAW FLOWER *
 510  REM   * INITIALIZE *
 770  REM   * DRAW FLOWER *
```

File Name: **WS21**

```
 1  REM   * FILE NAME IS WS21 *
 2  REM   * WORKSHEET 21 - PROBLEMS 1-10*
 9  REM   * WORKSHEET 21 - PROBLEM 1 *
 54  REM   * WORKSHEET 21 - PROBLEM 2 *
 89  REM   * WORKSHEET 21 - PROBLEM 3 *
 129  REM   * WORKSHEET 21 - PROBLEM 4 *
 179  REM   * WORKSHEET 21 - PROBLEM 5 *
 379  REM   * WORKSHEET 21 - PROBLEM 6 *
 409  REM   * WORKSHEET 21 - PROBLEM 7 *
 519  REM   * WORKSHEET 21 - PROBLEM 8 *
 569  REM   * WORKSHEET 21 - PROBLEM 9 *
 764  REM   * WORKSHEET 21 - PROBLEM 10 *
```

File Name: **WS22**

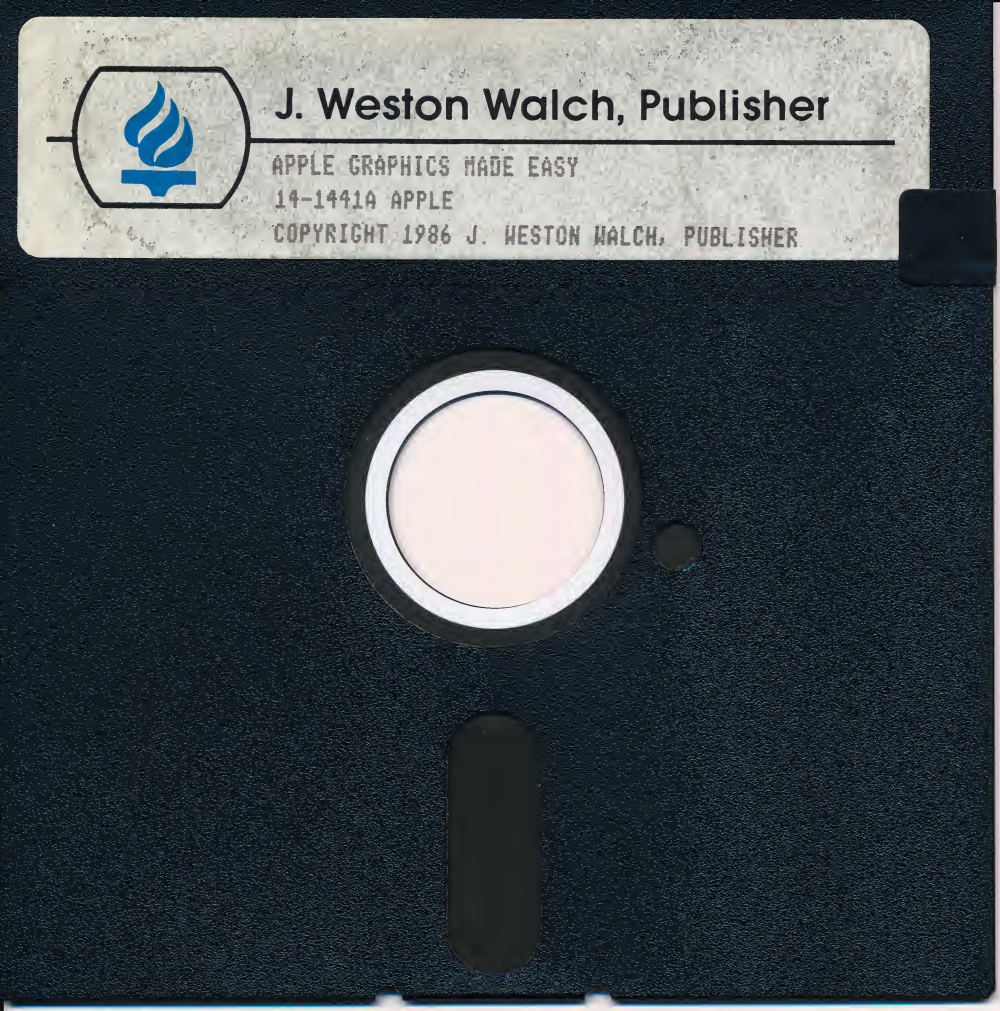
```
 1  REM   * FILE NAME IS WS22 *
 2  REM   * WORKSHEET 22 - PROBLEMS 1-8 *
 4  REM   * WORKSHEET 22 - PROBLEM 1 *
 199  REM   * WORKSHEET 22 - PROBLEM 2 *
 399  REM   * WORKSHEET 22 - PROBLEM 3 *
```

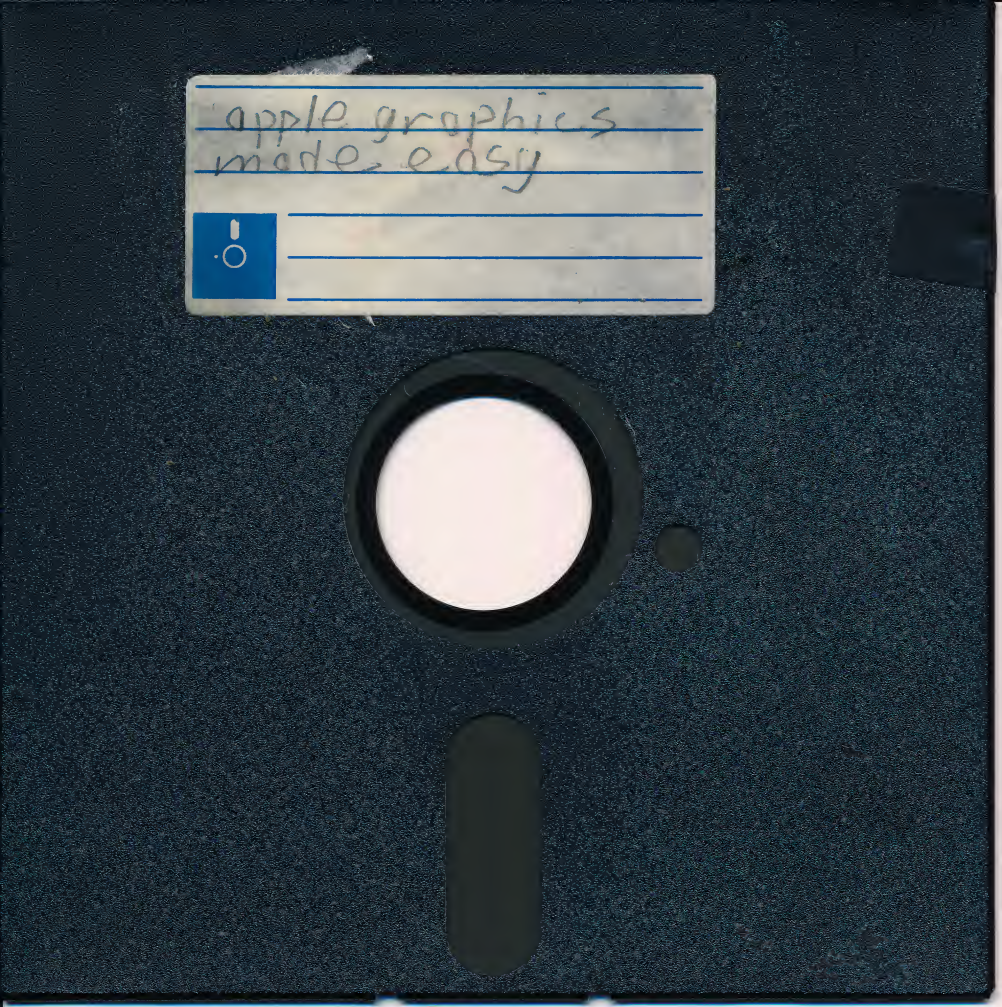
File Name: **WS22** (Continued)

```
 499  REM   * WORKSHEET 22 - PROBLEM 4 *
 599  REM   * WORKSHEET 22 - PROBLEM 5 *
 799  REM   * WORKSHEET 22 - PROBLEM 6 *
 999  REM   * WORKSHEET 22 - PROBLEM 7 *
1Ø99  REM   * WORKSHEET 22 - PROBLEM 8 *
```

File Name: **WS23**

```
   1  REM   * FILE NAME IS WS23 *
   2  REM   * WORKSHEET 23 - PROBLEMS 1-2 *
   4  REM   * WORKSHEET 23 - PROBLEM 1 *
 699  REM   * WORKSHEET 23 - PROBLEM 2 *
```


J. Weston Walch, Publisher
APPLE GRAPHICS MADE EASY
14-1441A APPLE
COPYRIGHT 1986 J. WESTON WALCH, PUBLISHER


apple graphics
made easy

OPERATING INFORMATION

Apple

Backup Copies: Before using your J. Weston Walch, Publisher MicroWare disk, make at least one backup copy. See the booklet or teacher's guide that came with your MicroWare disk for the number of copies you are allowed to make. We recommend the following procedure for making backup copies:

Use the COPYA program on the DOS 3.3 System Master disk. Start the computer with the DOS 3.3 disk. Be sure the **CAPS LOCK** key is down. Type **RUN COPYA** then press return. When the disk drive stops spinning, take the DOS 3.3 disk out of the drive.

If you have one disk drive, press **6** for the slot number, then press **1** for the *original* drive number. Next, press **6** for the slot number, then press **1** for the *duplicate* drive number. Put the original MicroWare disk in the drive. The program will tell you when to put the blank disk—the one that will become the duplicate—in the drive. Press return to begin copying.

If you have two disk drives, press **6** for the slot number, then press **1** for the *original* drive number. Next, press **6** for the slot number, then press **2** for the *duplicate* drive number. Put the *original* MicroWare disk in drive 1. Put a blank disk in drive 2; this disk will become the duplicate. Press return to begin copying.

Control-T: If you press the **CONTROL** and **T** keys at the same time when the J. Weston Walch, Publisher copyright appears on the screen, the program will display a message telling you how many copies of the disk you are allowed to make. The **CONTROL-T** message may also contain specific information about the program. Check the **CONTROL-T** message the first time you run the program. *Please note:* **CONTROL-T** does not work on data disks. Data disks contain files to be used with other programs, such as a word processing program. Data disks will not "boot," that is, they won't run automatically. If you try to boot a data disk, the computer will tell you there is no DOS on the disk. Information about the data disk is included in the teacher's guide.